



Patent  
Attorney Docket No. 015290-756

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

Michael SETTON

Application No.: 10/622,652

Filing Date: July 21, 2003

Title: ULSI MOS WITH HIGH DIELECTRIC CONSTANT GATE INSULATOR

Group Art Unit: 2815

Examiner: Unassigned

Confirmation No.: 3865

**FIRSTA  
INFORMATION DISCLOSURE STATEMENT  
TRANSMITTAL LETTER**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Enclosed is a **FIRSTA** Information Disclosure Statement and accompanying form PTO-1449 for the above-identified patent application.

- ☒ No additional fee for submission of an IDS is required.
- ☐ The fee of \$180.00 (1806) as set forth in 37 C.F.R. § 1.17(p) is also enclosed.
- ☐ A statement under 37 C.F.R. § 1.97(e) is also enclosed.
- ☐ A statement under 37 C.F.R. § 1.97(e), and the fee of \$180.00 (1806) as set forth in 37 C.F.R. § 1.17(p) are also enclosed.
- ☐ Charge \_\_\_\_\_ to Deposit Account No. 02-4800 for the fee due.
- ☐ A check in the amount of \_\_\_\_\_ is enclosed for the fee due.

The Director is hereby authorized to charge any appropriate fees under 37 C.F.R. §§ 1.16, 1.17 and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800. This paper is submitted in duplicate.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

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Date: 2/17/04

By

Peter K. Skiff

Registration No. 31,917



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of	)	
Michael SETTON	)	Group Art Unit: 2815
Application No.: 10/622,652	)	Examiner: Unassigned
Filed: July 21, 2003	)	Confirmation No.: 3865
For: ULSI MOS WITH HIGH DIELECTRIC	)	
CONSTANT GATE INSULATOR	)	

**FIRST INFORMATION DISCLOSURE STATEMENT**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure as set forth in 37 C.F.R. § 1.56, the accompanying information is being submitted in accordance with 37 C.F.R. §§ 1.97 and 1.98.

Pursuant to 37 C.F.R. § 1.98, a copy of each of the documents cited is enclosed. However, copies of the listed U.S. patents are not enclosed since it is no longer required according to the July 11, 2003 waiver of the requirement for copies of cited U.S. patents and U.S. patent application publications in national patent applications filed after June 30, 2003 and international applications entering the national stage under 35 U.S.C. § 371 after June 30, 2003.

The documents are being submitted within three (3) months of the filing or entry of the national stage of this application or before the first Office Action on the merits, whichever is later. Since these documents are being filed within the time period set forth in 37 C.F.R. § 1.97(b), no fee or statement is required.

To assist the Examiner, the document is / documents are listed on the attached form PTO-1449. It is respectfully requested that an Examiner initialed copy of this form be returned to the undersigned.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

Date

2/17/04

By:

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# **FIRST INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

(use as many sheets as necessary)

**Complete if Known**

Application Number	10/622,652
Filing Date	July 21, 2003
First Named Inventor	Michael SETTON
Examiner Name	Unassigned
Attorney Docket Number	015290-756

Sheet 1 of 2

**U.S. PATENT DOCUMENTS**

Examiner Initials	Document Number	Kind Code (if known)	Name of Patentee or Applicant of Cited Document	Issue/Publication Date (MM-DD-YYYY)
	3,731,163		Shukus	05-1993
	4,670,355		Matsudaira	06-1987
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**FOREIGN PATENT DOCUMENTS**

Examiner Initials	Document Number	Kind Code (if known)	Country	Date of Publication (MM-DD-YYYY)	Translation	
					Yes	No
	0844647	A3	EPO	05-1998		
	60-107838		JAPAN	06-13-1985		

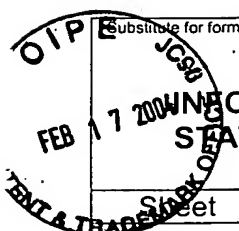
**NON-PATENT LITERATURE DOCUMENTS**

Examiner Initials	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	Alers, G.B. et al., "Nitrogen plasma annealing for low temperature Ta <sub>2</sub> O <sub>5</sub> films", Applied Physics Letters, vol. 72, no. 11, 1308-1310, 16 March 1998
	Campbell, S.A., et al., "MOSFET Transistors Fabricated with High Permittivity TiO <sub>2</sub> Dielectrics, IEEE Transactions on Electron Device, Vol. 44, No. 1, 104-109, January 1997.
	Cava, R.F. et al., "Enhancement of the dielectric constant of Ta <sub>2</sub> O <sub>5</sub> through substitution with TiO <sub>2</sub> ", Nature, Vol. 377, 215-217, 21 September 1995
	Chatterjee, A. et al., "Sub-100nm Gate Length Metal Gate NMOS Transistors Fabricated by a Replacement Gate Process", IEEE, 1997
	Gan, J.-Y et al., "Dielectric property of (TiO <sub>2</sub> ) <sub>x</sub> -(Ta <sub>2</sub> O <sub>5</sub> ) <sub>1-x</sub> thin films", Appl. Phys. Lett. 72 (3), 19 January 1998, 332-334
	Hu, J.C. et al., "Feasibility of Using W/TiN as Metal Gate for conventional 0.13μm CMOS Technology and Beyond", IEEE, 1997

Examiner Signature

Date Considered

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with M.P.E.P. § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.



Substitute for form 1449A/PTO & 1449B/PTO		<b>Complete if Known</b>	
<b>FIRST INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> (use as many sheets as necessary)		<b>Application Number</b>	10/622,652
		<b>Filing Date</b>	July 21, 2003
		<b>First Named Inventor</b>	Michael SETTON
		<b>Examiner Name</b>	Unassigned
		<b>Attorney Docket Number</b>	015290-756
Sheet	2	of	2

NON-PATENT LITERATURE DOCUMENTS	
Examiner Initials	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	Joshi, P.C., et al., "Structural and electrical properties of crystalline (1 - x) Ta <sub>2</sub> O <sub>5</sub> - xAl <sub>2</sub> O <sub>3</sub> thin films fabricated by metalorganic solution deposition technique", Apply. Phys. Lett. 71 (10), 8 September 1997, 1341-1343
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	Meng, J.F., et al., "Raman Investigation on (Ta <sub>2</sub> O <sub>5</sub> ) <sub>1-x</sub> (TiO <sub>2</sub> ) <sub>x</sub> System at Different Temperatures and Pressures", J. Phys. Chem Solids, Vol. 58, No. 10, 1503-1506, 1997
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	Reddy, P.K, et al., "Dielectric Properties of Tantalum Oxynitride Films", <i>Physica Status Solidi A</i> , July 1979, vol. 54, no. 1, pages K63-K66
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	Patent Abstracts of Japan, vol. 098, no. 011, September 1998, JP 10 178170A
	Chinese Official Action dated April 18, 2003 for Application No. 99808151.5

Examiner Signature		Date Considered	
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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with M.P.E.P. § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.